UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/655,236	09/03/2003	Ruolin Li	42P16213X	5717

8791 7590 09/11/2006

BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025-1030

EXAMINER	
RUDE, TIMOTHY L	

ART UNIT	PAPER NUMBER
2883	

DATE MAILED: 09/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/655,236	LI, RUOLIN	
	Examiner	Art Unit	
	Timothy L. Rude	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims

Claims 1, 8, 16, and 24 are amended.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-21 and 24-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henry et al (Henry) U.S. Patent 6,137,939 in view of Chen et al (Chen) USPAT 6,118,909.

Regarding independent claims 1, 8, 16, and 24, Henry et al. teach an apparatus comprising a wave guide clad comprising a first material (col 4, line 8-10 and Fig 1b, ref sign 16 where the first material is silica) whose refraction index varies by a first magnitude according to a temperature variation of the first material and a second material (col 6, lines 55-57 and Fig 1b, ref sign 20 where the second material is an elastomer) whose refraction index varies by a second magnitude according to a

temperature variation of the second material, the second magnitude being inversely related to the first magnitude (col 4, lines 60-64), wherein the wave guide core, 14, is within the wave guide clad, and wherein the first and second material exist outside of the core.

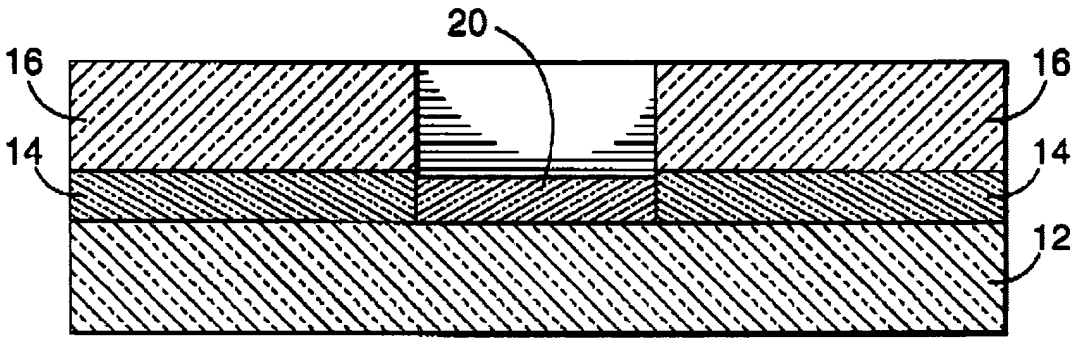


FIG 1b

Regarding independent claims 8 and 16, Henry et al. teach an apparatus comprising a first means comprising two materials (a first material, col 4, line 8-10 and Fig 1b, ref sign 16 is silica and the second material, col 6, lines 55-57 and Fig 1b, ref sign 20 is an elastomer) each having a refraction index to change in opposite magnitude in relation to the other in response to variations in temperature of the waveguide (col 4, lines 60-64).

Regarding independent claim 24, Henry et al. teach a system comprising a light source to emit a spectrum of light wavelengths (col 1, lines 26-30); a wave guide to guide light from the light source having a first wavelength (Fig 5a, ref sign 130), the

wave guide comprising a clad material (col 4, line 8-10 and Fig 1b, ref sign 16), the wave guide including a polymer to help maintain an effective wave guide refraction index within an optical mode of the waveguide (col 6, lines 55-57 and Fig 1b, ref sign 20 where an elastomer is a type of polymer) that is independent of temperature changes in the wave guide (col 4, lines 17-20).

While the reference does not specifically state the performance or intended use limitations of stabilizing a light's wavelength as in claim 8 or stabilizing a light's phase as in claim 16, the structure as claimed is present in Henry and the device is thus capable of stabilizing a light's wavelength or phase since it is independent of temperature (col 4, lines 17-20). Also, while the reference does not specifically state "the waveguide clad having an effective refraction index that is dependent upon a portion of the area of a side of the second material coplanar with and existing within a cross section of only a portion of an optical mode surrounding a waveguide core, the structure as claimed is present and the device is capable of having an effective refraction index that is dependent upon a portion of the area of a side of the second material coplanar with and existing within a cross section of only a portion of an optical mode surrounding a waveguide core (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997). Please note obviousness is not applied. All device limitations have been considered and examiner maintains all above limitations are anticipated by the structure of applied Henry.

Henry does not explicitly disclose a device wherein the first and second material exist only outside of the core.

Chen teaches the use of first and second materials (cap and polymer) only outside the core as a means to achieve good temperature compensation (Abstract) while simplifying fabrication by eliminating unwanted photolithography and etching steps (col. 6, lines 9-16).

FIG. 2

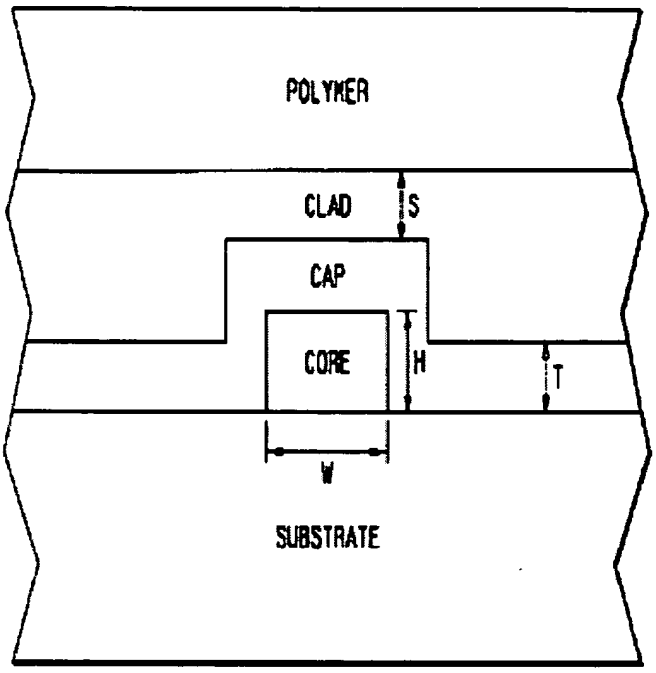
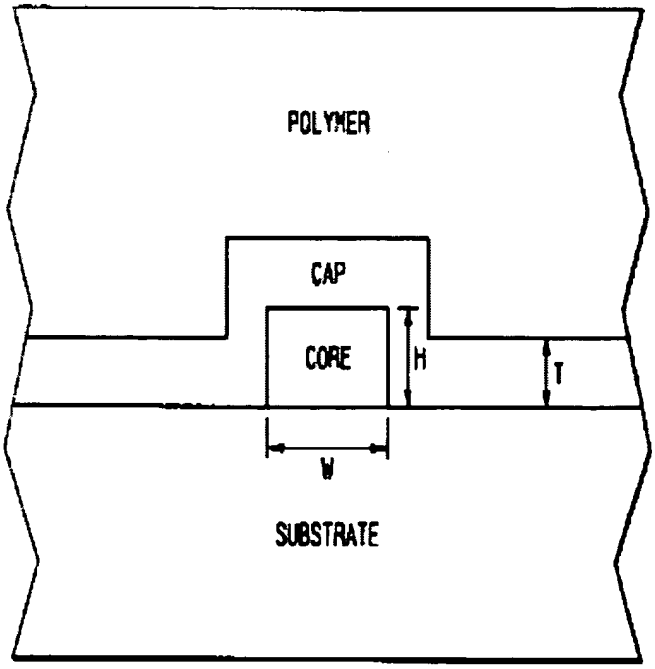

POLYMER
CLAD
S
CAP
CORE
H
T
W
SUBSTRATE

FIG. 3


POLYMER
CAP
CORE
H
T
W
SUBSTRATE

Chen is evidence that workers of ordinary skill in the art would find the reason, suggestion, or motivation to add the use of first and second materials only outside the core as a means to achieve good temperature compensation while simplifying fabrication by eliminating unwanted photolithography and etching steps.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Henry with the first and second materials only outside the core of Chen as a means to achieve good temperature compensation while simplifying fabrication by eliminating unwanted photolithography and etching steps.

Regarding claims 2 and 25, Henry discloses the first magnitude contributes to an increase in the refraction index of the first material in response to the temperature variation and the second magnitude contributes to a decrease in the refraction index of the second material in response to the temperature variation since silica has a positive dn/dT (col 4, lines 29-31) and the elastomer moves in the opposite direction (col 4, lines 60-64).

Regarding claim 3, Henry discloses there is a source for producing light (col 1, lines 26-30).

Regarding claims 4 and 29, Henry discloses there can also be a grating (col 7, lines 59-61) since Bragg-filters are also contemplated.

Regarding claim 7, while Henry does not specifically state "the effective refraction index equal to a first sum of the products of the coplanar cross-sectional areas of the second material existing within the optical mode and the refraction index of the second material, the core and the refraction index of the core, the first material and the refraction index of the first material, the first sum being divided by a second sum of the cross-sectional areas of the second material existing with the optical mode, the core and the first material", the structure as claimed is present in Henry and the effective refraction index is capable of being equal to a first sum of the products of the coplanar cross-sectional areas of the second material existing within the optical mode and the refraction index of the second material, the core and the refraction index of the core, the first material and the refraction index of the first material, the first sum being divided by a second sum of the cross-sectional areas of the second material existing with the optical mode, the core and the first material.

Regarding claim 17, Henry discloses one of the two materials is a polymer (col 6, lines 55-57 and Fig 1b, ref sign 20 where an elastomer is a type of polymer) distributed in segments along the length of the waveguide core within the waveguide (Fig 5a, ref sign 20).

Regarding claims 27 and 28, while Henry discloses does not specifically state the phase of the light is substantially independent of temperature as in claim 27 or the wavelength of the light is substantially independent of temperature as in claim 28, the structure as claimed is present in Henry et al. and the device is thus capable of having the wavelength and phase independent of temperature (col 4, lines 17-20) (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997).

Regarding claim 5, Henry in view of Chen disclose the limitations of claim 1 as described above. However, the reference is silent with respect to the polymer existing within the grating area.

Henry teaches that Bragg filters (gratings) can benefit from the aspects of the invention (col 7, lines 59-61).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Henry et al. such that the polymer exists within the grating area

The motivation is to make the grating independent of temperature as well (col 4, lines 17-20).

Regarding claim 6, Henry teaches the limitations of claim 1 as described above. However, the reference is silent with respect to the first and second material contributing to an effective refraction index of the wave guide clad.

The structure as claimed is present in Henry et al. and the first and second material are thus capable of contributing to an effective refraction index of the wave guide clad since the device is independent of temperature (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997)).

Regarding claims 12 and 13, while the reference does not state a second means for stabilizing the phase of light across varying temperatures of the waveguide wherein the means comprises the two materials in proportionate amounts so as to make a round trip refraction distance of a photon of the light substantially independent of temperature, the structure as claimed is present in Henry et al., and the device is thus capable of making a round trip refraction distance of a photon independent of temperature for the purpose of stabilizing phase (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997).

Regarding claim 14, Henry discloses one of the two materials is a polymer (col 6, lines 55-57 and Fig 1b, ref sign 20 where an elastomer is a type of polymer) and one is a clad.

Regarding claims 15 and 18, while Henry is silent with respect to the effective index for the waveguide being dependent upon the product of length of a polymer segment and refraction index of the polymer, the reference does teach that the refraction index varies on the relative amounts (col 4, lines 64-67 and col 5, lines 13-18) and more polymer should be used in the longer waveguides (longer lengths). The

structure as claimed is present in Henry et al. and the effective refraction index thus depends on the product of the length of the polymer segment and the refraction index of the polymer (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997)).

Regarding claim 19, the effective index of refraction is substantially constant since the structure as claimed is present in Henry et al.

Regarding claims 20 and 21, the light source can be external to the waveguide (col 1, lines 26-30) since the light is launched into a separate/distinct input ports.

Regarding claims 9 and 26, Henry in view of Chen disclose the limitations as described above.

While Henry is silent with respect to variations in the light's wavelength in response to temperature variations of the waveguide depending on the relative amounts of the first and second materials within the optical mode of the wave guide clad, Henry does teach the refraction index varies on the relative amounts (col 4, lines 64-67 and col 5, lines 13-18) and more polymer should be used in the longer waveguides.

Therefore, variations in the light's wavelength response to temperature variations of the waveguide depend on the relative amounts

Regarding claim 10, Henry discloses that one of the two materials is a polymer (col 6, lines 55-57 and Fig 1b, ref sign 20 where an elastomer is a type of polymer).

Regarding claim 11, Henry in view of Chen disclose the limitations of the claims as described above.

However, Henry is silent with respect to the polymer existing at opposite ends of a grating within the wave guide clad.

Henry teaches that Bragg filters (gratings) can benefit from the aspects of the invention (col 7, lines 59-61).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Henry et al. such that the polymer exists on opposite ends of a grating within the waveguide clad.

The motivation is for making the grating independent of temperature as well (Henry et al., col 4, lines 17-20).

Claims 22-23 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henry in view of Chen and further in view of Tanaka et al., U.S. Patent 6,320,888.

Regarding claims 22 and 30, Henry and Chen teach the limitations as described above. However, the reference is silent with respect to the light source being a semiconductor optical amplifier (SOA) chip.

Tanaka et al, describes a frequency stabilized laser using a SOA chip (col 12, lines 10-17).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Henry et al. in view of Deacon to include a light source which is a semiconductor optical amplifier (SOA) chip

The motivation is to amplify multiplexed light (col 12, line 16).

Regarding claim 23, while Henry is silent with respect to the wavelength corresponding to the max power within the emission spectrum, the structure as claimed is present as described above and the device is thus capable of having the wavelength correspond to the maximum power within the emission spectrum of the SOA. (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997).

Response to Arguments

Applicant's arguments filed on 23 June 2006 have been fully considered but they are not persuasive.

Applicant's ONLY substantive arguments are as follows:

(1) Regarding base claims 1, 8, 16, and 24, the amendment limits them to first and second materials having differing variance in refractive indices wherein the first and second materials do not exist within the wave guide core.

(2) Dependent claims are allowable because they directly or indirectly depend from an allowable base claim.

Examiner's responses to Applicant's ONLY arguments are as follows:

(1) It is respectfully pointed out that Chen is applied to teach first and second materials only outside the core in order to simplify fabrication by eliminating unwanted photolithography steps and etching steps.

(2) It is respectfully pointed out that in so far as Applicant has not argued rejection(s) of the limitations of dependent claim(s), Applicant has acquiesced said rejection(s).

Any references cited but not applied are relevant to the instant Application. **Please note strong teachings exist in Satzke US PGPUB 2002/0186943 A1 and in Jang USPAT 6,463,684 B2.**

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L. Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

tlr

Timothy L Rude
Examiner
Art Unit 2883

Frank G. Font
Supervisory Patent Examiner
Technology Center 2800